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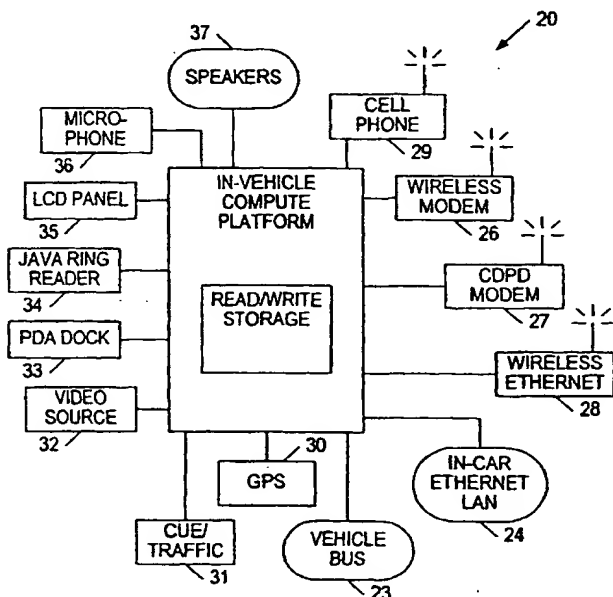
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[Continued on next page]

(54) Title: VEHICLE COMPUTERIZED NETWORK SYSTEM



(57) Abstract: A system for integrating components into a vehicle wherein the components comprise devices coupled to an in-car network. The network provides for easy re-configuration and upgrading of the vehicle, as well as improved communication of information between the vehicle's systems and integration of the vehicle network into external networks. The network may include one or more devices which are addressable using IP addresses or object terminology. The devices may include various servers and clients, such as microphones, cameras, GPS receivers, interfaces to on-board diagnostic systems, communication devices, displays, CD players, radios, speakers, security devices and LANs (local area networks). Devices may easily be connected or disconnected to upgrade or reconfigure the vehicle's systems, and software and services can easily be provided to the various devices through the network. The network can enable the interaction of various network devices to increase the capabilities or utility of devices which may otherwise be limited. The system therefore provides an easy and inexpensive means to improve or otherwise modify the functionality of the vehicle. In one embodiment, the in-vehicle network comprises an ethernet, although other embodiments can be implemented in any

other type of network. Communication devices such as wireless modems and wireless ethernet allow communications with devices and networks external to the in-vehicle network so that data, software, services and other information can be downloaded from or uploaded to these external sources. The in-vehicle network can also be coupled to an external network through these communication devices so that it can function as a device (a sub-network) on the external network. Traditional vehicle components may be replaced by network devices, thereby providing extended functionality to the driver. For example, the vehicle's dashboard may be replaced by a monitor, which displays images of dashboard instruments, vehicle data and other information to the driver. Graphics generated by a server on the network may be designed to emulate digital or analog gauges which are normally found on a dashboard.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

In ternational Application No

PCT/US 00/16496

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G06F9/445 H04L29/06 B60R16/02 H04L12/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G06F H04L B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC, COMPENDEX, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 732 074 A (BRAITBERG MICHAEL F ET AL) 24 March 1998 (1998-03-24)	39,40, 44-51, 53,54
Y	abstract column 1, line 1 -column 5, line 23 column 6, line 61 -column 14, line 39 figure 2	1,4-8, 11,14, 17-20
Y	US 5 442 553 A (PARRILLO LOUIS C) 15 August 1995 (1995-08-15) abstract column 1, line 11 -column 6, line 60 figure 1	1,4-8, 11,14, 17-20

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

9 November 2000

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Authorized officer

Lievens, K

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 00/16496

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-20, 39, 40, 44-51, 53, 54

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/SA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-20,39,40,44-51,53,54

A system and a method for providing software upgrades to a vehicle.

2. Claims: 21-38, 41

A system and a method for communicating between a sub-network and a primary network comprising a proxy server.

3. Claims: 55-75

A system and a method for displaying information to a driver.

4. Claims: 42,43,52,76-93

A system and a method for emulating a vehicle component.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/16496

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5732074 A	24-03-1998	AU 1525197 A CA 2243454 A EP 0875111 A WO 9726750 A	11-08-1997 24-07-1997 04-11-1998 24-07-1997
US 5442553 A	15-08-1995	NONE	